

## **REMARKS**

### **I. Status of Claims**

Claims 13-34 are pending in the application. Claims 1-12 are canceled. Claims 13, 23, 33, and 34 are independent.

Claims 13 and 23 are currently amended. Support for the additional claim language of claims 13 and 23 may be found in the Applicant's specification at least at page 16, lines 20 to 26, as well as on page 28, lines 17 to 30.

Claims 33-34 are newly added. Newly added claims 33 and 34 generally track currently pending claims 13 and 23, respectively, except for the addition of some claim language. Support for the additional claim language may be found in the specification at least at page 21, lines 14 to 21 and in Fig. 7.

Claims 13-16, 23, and 32 stand rejected under 35 USC 102(b) as allegedly being anticipated by Harndorf et al. (PCT Publication No. WO 02/38932) ("Harndorf").

Claims 17, 20, 24, and 27 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Harndorf, as applied to claims 14, 15 and 16, respectively, above, in view of Tashiro et al. (USP 6,622,480) ("Tashiro").

Claims 18, 19, 21, 22, 25, 26, and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicant respectfully requests reconsideration of these rejections in view of the foregoing amendments and the following remarks.

### **II. Allowable Subject Matter**

Claims 18, 19, 21, 22, 25, 26, and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### **III. Pending Claims**

**(i) Claims 13 and 23**

Independent claims 13 and 23 stand rejected under 35 USC 102(b) as allegedly being anticipated by Harndorf.

The Applicant respectfully submits that claim 13 is patentable over Harndorf at least because it recites, "...the mode change section changes the heating mode when the estimated accumulation amount is within the mode change range and less than or equal to a normal burn-up start determination value, which is slightly greater than an end determination value, from a normal heating mode, for heating the exhaust purification apparatus by continuously keeping the air-fuel ratio in the exhaust system low, to a burn-up heating mode, for burning up the particulate matter by intermittently lowering the air-fuel ratio in the exhaust system so that a temperature of a catalyst bed is elevated so that the temperature of the catalyst bed is higher in the burn-up heating mode than in the normal heating mode." (emphasis added)

The Applicant respectfully submits that claim 23 is patentable over Harndorf at least because it recites, "...changing from the normal heating mode to a burn-up heating mode for intermittently lowering the air-fuel ratio in the exhaust system by intermittently adding fuel to the exhaust when the estimated accumulation amount is less than or equal to the normal burn-up start determination value so that a temperature of a catalyst bed is elevated so that the temperature of the catalyst bed is higher in the burn-up heating mode than in the normal heating mode." (emphasis added)

Harndorf discloses first phase (t0-t1), second phase (t1-t2), and third phase (t3 later). However, the Applicant respectfully submits that Harndorf fails to disclose a condition for changing the normal heating mode to the burn-up heating mode, as recited in the inventions of claims 13 and 23. Instead, Harndorf merely describes the timing of ending the second phase (*See* col. 6, lines 37 to 52). Moreover, Harndorf does not describe the condition for starting the period t3. Therefore, Harndorf does not disclose the condition for changing from the second phase to the third phase. Further, it is respectfully submitted that Harndorf does not describe controlling the period between t2 and t3. Based on the foregoing, the Applicant respectfully submits that the

inventions of claims 13 and 23—including the limitations concerning the conditions for changing the heating modes—are neither taught nor suggested by Harndorf. Thus, Harndorf does not anticipate Applicant's claims 13 and 23.

In addition, the Applicant respectfully submits that none of the other references cited identify a reason for modifying Harndorf in the manner as claimed by the Applicant. The Applicant respectfully submits that, as discussed in *KSR Int'l Co. v. Teleflex, et al.*, No. 04-1350, (U.S. Apr. 30, 2007), it remains necessary to identify the reason why a person of ordinary skill in the art would have been prompted to combine alleged prior art elements in the manner as claimed by the Applicant. Accordingly, claims 13 and 23 are not rendered obvious by Harndorf in view of the cited references.

The Applicant respectfully submits that, for at least these reasons, claims 13 and 23, as well as their dependent claims, are patentable over the cited references.

**(ii) New Claims 33 and 34**

The Applicant respectfully submits that newly added claims 33 and 34 are also patentable over the cited references.

The Applicant respectfully submits that claim 33 is patentable over Harndorf at least because it recites, "...in the burn-up heating mode, the amount of fuel repeatedly added, the period of fuel addition, and the period when fuel is not added are set so as to realize activated oxygen state and exhaust temperatures at upstream and downstream sides of the exhaust purification apparatus capable of burning up the particulate matter accumulated in the exhaust purification apparatus."

The Applicant respectfully submits that claim 34 is patentable over Harndorf at least because it recites, "...wherein in the burn-up heating mode, the amount of fuel repeatedly added, the period of fuel addition, and the period when fuel is not added are set so as to realize activated oxygen state and exhaust temperatures at upstream and downstream sides of the exhaust purification apparatus capable of burning up the particulate matter accumulated in the exhaust purification apparatus."

Claims 33 and 34 concern the flexibility of the control of the burn-up heating mode of certain embodiments of the present invention which depend on the estimated particulate matter accumulation amount. Utilizing the inventions of claims 33 and 34, the time period required for burning up the accumulated particulate matter is shortened—while the sudden burning of a large amount of particulate matter may be avoided.

That being said, Harndorf does not disclose that in the third phase ( $t_3$  or later), the amount of fuel repeatedly added, the period of fuel addition, and the period when fuel is not added, are set so as to realize an activated oxygen state and exhaust temperatures at upstream and downstream sides of the exhaust purification apparatus that is capable of burning up the particulate matter accumulated in the exhaust purification apparatus. Rather, Fig. 3 of Harndorf shows that the amount of fuel repeatedly added in the third phase ( $t_3$  or later) is set equal to the constant quantity QKZ. This quantity is adjusted so that the exhaust gas temperature upstream of the filter remains constant (*See* col. 7, lines 53-55). Thus, based on the foregoing, claims 33 and 34 are not anticipated by Harndorf.

In addition, the Applicant respectfully submits that none of the other references cited identify a reason for modifying Harndorf in the manner as claimed by the Applicant. The Applicant respectfully submits that, as discussed in *KSR Int'l Co. v. Teleflex, et al.*, No. 04-1350, (U.S. Apr. 30, 2007), it remains necessary to identify the reason why a person of ordinary skill in the art would have been prompted to combine alleged prior art elements in the manner as claimed by the Applicant. Accordingly, claims 33 and 34 are not rendered obvious by Harndorf in view of the cited references.

The Applicant respectfully submits that, for at least these reasons, newly added claims 33 and 34 are also patentable over the cited references.

#### **IV. Conclusion**

In light of the above discussion, the Applicant respectfully submits that the present application is in all aspects in allowable condition, and earnestly solicits favorable

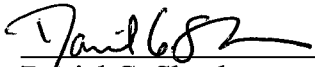
**PATENT**

U.S. Application No. 10/589,204  
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reconsideration and early issuance of a Notice of Allowance. The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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By:   
Daniel G. Shanley  
Reg. No. 54,863

KENYON & KENYON LLP  
1500 K Street, N.W., Suite 700  
Washington, D.C. 20005  
Tel: (202) 220-4200  
Fax: (202) 220-4201  
Customer No. 23838